Mitigating the Possibility of Contact with High Voltage While Working on Intercryostat Detector Systems

Revision Log

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1.0	1/16/01	All	Initial Issue

Approvals

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1 INTRODUCTION

1.1 Purpose

This procedure provides instructions on how to safely avoid contact with bias voltages from the DØ high voltage system while working on DØ Intercryostat Detector (ICD) systems.

1.2 Scope and Applicability

The ICD high voltage is normally controlled by software operated by detector experts or shift personnel from the DØ control room. The only occasion when there is risk of exposure to high voltage is when work needs to be done on the high voltage cabling, or to the high voltage modules and fanouts. Following this procedure is required of anyone who may be exposed to bias voltages from the DØ high voltage system while working on the ICD system. The ICD Group Leader shall insure that such workers are competent in the use of this procedure.

This procedure does not address the maintenance or repair of ICD high voltage supplies.

2 PRECAUTIONS AND LIMITATIONS

A. Failure to follow this procedure could result in surprising and/or painful electrical shock, with added risk because ICD work sometimes occurs on ladders or elevated platforms.

3 PREREQUISITE ACTIONS

3.1 Equipment

[1] Obtain electrostatic voltmeter and SHV shorting connector (if needed).

4 PROCEDURE

4.1 Power Supply Disablement

[1] Inform the DØ Control Room shift personnel (if present) that work is going to be performed on the ICD system.

[2] Do one of the following:

[a] Request that the shift personnel set the software controls to the DISABLED state for the relevant supplies.

[b] Turn off the high voltage(s) to the relevant detector components by setting their software state to DISABLED.

[c] Turn off the power supply to the relevant crate(s).

[3] Verify that the high voltage has been disabled.

[4] IF work is expected to take more than one hour, THEN do the following:

[a] Place caution tags on the relevant crate(s);

[b] Place a note on the software control window in the DØ Control room;

[c] Place a note in the control room logbook, concerning the work.

4.2 Disconnecting Cables

NOTE: *If cables need to be unplugged at the high voltage modules or anywhere in between, care must be taken to discharge any stored charge in the cables. A SHV shorting connector is useful for this purpose.*

If high voltage of a few thousand volts has been applied for several hours and then a cable is disconnected without a discharge path, stored charge in the cable dielectric will gradually leak out and recharge the cable. Typical recharge voltages are about 10% of the applied high voltage (i. e. about 85 volts for the ICD).

[1] Disconnect high voltage cables, as needed.

[2] Discharge cables and capacitors, using the shorting connector, if necessary.

[3] Verify discharge of high voltage using the electrostatic voltmeter.

4.3 Restoring Service

[1] Remove any shorting connectors and plug the high voltage cables back into their connectors to the detector or the modules from which they were disconnected, after completing work.

[2] Verify that no one else is working on the high voltage system.

[3] Restore the relevant high voltage to the appropriate condition (either stand-by or 100%), or ask the shift personnel on duty to do it.

[4] IF caution tags and/or console notes were used, THEN remove them.

[5] IF an entry was placed in the control room logbook concerning the work, THEN indicate in the logbook that the work was completed.